Extra Problems for Test Redo

1a. Find \( f'(x) \) for \( f(x) = 3 \sin(x) \).

b. Find \( f'(x) \) for \( f(x) = (8x^2 + 2x - 3)(5x^3 - 4x + 3) \).

c. Find \( f'(x) \) for \( f(x) = (\cos 3x)^4 \).

d. Find \( f'(x) \) for \( f(x) = \frac{3x^2-4x+2}{5x^3-7x} \).

e. Find \( f'(x) \) for \( f(x) = ((5x^2 - 2)(3x^4 - 6x))^3 \).

2. Note: If you choose to redo this question, you will have to redo the whole question on the Redo Test. However you will not get a lower score than you received on the first test.

   i. Draw the graph given in problem #6, p. 227 Stewart where a function \( f(x) \) is defined for \( x \in [0,6] \). Assign values to the y axis (you decide what they are). Answer questions (a)-(f) for this function.

   ii. Modify the graph in #6 so that the function is now defined for \( 0 < x \leq 6 \) (rather than for \( 0 \leq x \leq 6 \)) and so now the function has an absolute minimum at \( x = 6 \) but it does not have an absolute maximum.

3. The surface area of a sphere of radius \( r \) is given by \( S(r) = 4\pi r^2 \).

   i. If the surface area is \( 36\pi \text{ cm}^2 \), what is the radius?

   ii. Solve Problem #12 on page 187 Stewart.

4. Note: If you choose to redo this question, you will have to redo the whole question on the Redo Test. However you will not get a lower score than you received on the first test.

   i. Problem #2, p. 193 Stewart.

   ii. Use the linear approximation function \( L(x) \) to estimate \( f(.02) \).

   iii. What is the exact value of \( f(.02) \)? What is difference between the exact value \( f(.02) \) and the value given by the linear approximate \( L(.02) \)?

5. Note: If on parts (a) and (b), you got the correct answer but just did not show your work clearly, you do not have to do the extra HW problem. Instead you should just write out in more detail your answers to (a) and (b).

   Similarly for (c) and (d). You should explain why the critical points are local max and min (using 1st or 2nd Derivative Test) but you do not need to do an extra HW problem.

   If you have more major problems, then repeat questions (a) - (e) for the function \( f(x) = 2x^3 - 3x^2 - 12x \).